

**EMPLOYEES' RETIREMENT SYSTEM OF THE STATE OF
HAWAII**

GASB STATEMENT NO. 67 ACCOUNTING AND FINANCIAL
REPORTING FOR PENSIONS

JUNE 30, 2015

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March 7, 2016

The Board of Trustees
Employees' Retirement System of
The State of Hawaii
City Financial Tower
201 Merchant St., Ste. 1400
Honolulu, HI 96813-9280

Dear Trustees:

This report provides information required by the Employees' Retirement System of the State of Hawaii ("ERS") in connection with the Governmental Accounting Standards Board (GASB) Statement No. 67 "Financial Reporting for Pension Plans."

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of satisfying the requirements of GASB Statement Nos. 67. These calculations have been made on a basis that is consistent with our understanding of this Statement. The calculation of the plan's liability for this report may not be applicable for funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB No. 67 may produce significantly different results. This report may be provided to parties other than the ERS only in its entirety and only with the permission of ERS.

This report is based upon information, furnished to us by ERS, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. This information was checked for internal consistency, but it was not otherwise audited.

Certain tables included in the Required Supplementary Information should include a 10-year history of information. As provided for in GASB No. 67, this historical information is only presented for the years in which the information was measured in conformity with the requirements of GASB No. 67. The historical information in this report will begin with the information presented for the fiscal year ending June 30, 2014.

The last section of the report which details the calculation of the single discount rate is not required to be included in your financial statements. However, this information may be requested by your auditors, therefore, we have included it in this report.

This report complements the actuarial valuation report that was provided to ERS and should be considered in conjunction with that report. Please see the actuarial valuation report as of June 30, 2015 for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

To the best of our knowledge, this report is complete, accurate, and in accordance with generally recognized actuarial methods. One or more of the undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the Academy of Actuaries to render the actuarial opinion herein.

The signing actuaries are independent of the plan sponsor.

Respectfully submitted,



By _____
Lewis Ward
Consultant



By _____
Joe Newton
FSA, EA, MAAA

SECTION A

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

as of June 30, 2015

	2015
Actuarial Valuation Date	June 30, 2015
Pension Plan's Fiscal Year Ending Date (Measurement Date & Reporting Date)	June 30, 2015
 Membership	
Number of	
- Retirees and Beneficiaries	44,283
- Inactive, Nonretired Members	21,253
- Active Members	67,310
- Total	132,846
Reported Payroll for Fiscal Year	\$ 3,995,447,345
 Net Pension Liability	
Total Pension Liability	\$ 23,238,395,386
Plan Fiduciary Net Position	14,505,464,556
Net Pension Liability	\$ 8,732,930,830
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	62.42%
Net Pension Liability as a Percentage of Covered Payroll	218.57%
 Development of the Single Discount Rate	
Single Discount Rate	7.65%
Long-Term Expected Rate of Return	7.65%
Long-Term Municipal Bond Rate*	3.80%
Last year ending June 30 in the 2015 to 2114 projection period for which projected benefit payments are fully funded	None

**Source: "State and Local Bonds" rate from Federal Reserve statistical release (H.15) as of June 26, 2015. The statistical release describes this rate as the "Bond Buyer Index, general obligation, 20 years to maturity, mixed quality." In describing this index, the Bond Buyer notes that the bonds' average credit quality is roughly equivalent to Moody's Investor Service's Aa2 rating and Standard & Poor's Corp AA.*

DISCUSSION

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67, "Financial Reporting for Pension Plans," replaces the requirements of GASB Statement No. 25, "Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans," and GASB Statement No. 50, "Pension Disclosures." GASB Statement No. 67 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability of employers and non-employer contributing entities for benefits provided through the pension plan.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system will be responsible for preparing and disclosing that information to comply with these accounting standards.

Financial Statements

GASB Statement No. 67 requires defined benefit pension plans to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position.

The *statement of fiduciary net position* presents the following items as of the end of the pension plan's reporting period, such as:

- assets;
- deferred inflows and outflows of resources;
- liabilities; and
- fiduciary net position (assets, plus deferred outflows, minus liabilities, minus deferred inflows).

The *statement of changes in fiduciary net position* presents the following for the plan's reporting period:

- additions, such as contributions and investment income;
- deductions, such as benefit payments and expenses; and
- net increase or decrease in the fiduciary net position (the difference between additions and deductions).

Notes to Financial Statements

GASB Statement No. 67 also requires the notes of the plan's financial statements to include additional disclosure information. This disclosure information should include:

- a description of the types of benefits provided by the plan, as well as automatic or ad hoc COLAs;
- the number and classes of employees covered by the benefit terms;
- the composition of the pension plan's Board and the authority under which benefit terms may be amended;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- a description of how fair value is determined;
- concentrations of investments greater than or equal to 5%;
- annual money-weighted rate of return on pension plan investments;
- the portion of the present value of benefits to be provided through the pension plan to current active and inactive plan members;
- the pension plan's fiduciary net position;
- the net pension liability;
- the pension plan's fiduciary net position as a percentage of the total pension liability;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the discount rates; and
- certain information about mortality assumptions and the dates of experience studies.

Required Supplementary Information

Statement No. 67 requires a 10-year fiscal history of:

- sources of changes in the net pension liability;
- information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll;
- comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy; and
- the annual money-weighted rate of return on pension plan investments for each year.

As shown above, you will need to include a determination of the annual money-weighted rate of return for your Notes to Financial Statements and Required Supplementary Information. Statement No. 67 requires that this information be determined using cash-flows with a frequency of not less than a monthly basis. We do not have the detailed financial information to determine this number. If you need our assistance please let us know.

Measurement of the Net Pension Liability

The net pension liability is to be measured as the total pension liability, less the amount of the pension plan's fiduciary net position. In actuarial terms, this will be the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2015 and a measurement date of June 30, 2015.

Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a single discount rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.65% the municipal bond rate is 3.80% (based on the weekly rate closest to but not later than the measurement date of the 20-Year Bond Buyer Index as published by the Federal Reserve); and the resulting single discount rate is 7.65%.

Effective Date and Transition

GASB Statements No. 67 is effective for a pension plan's fiscal years beginning after June 15, 2013, however, earlier application is encouraged by the GASB.

SECTION B

FINANCIAL STATEMENTS

STATEMENT OF FIDUCIARY NET POSITION
as of June 30, 2015

	2015
Assets	
Cash and Deposits	\$ 656,459,323
Receivables	
Accounts receivable and others	\$ 7,436,038
Investment sales proceeds	93,202,906
Accrued investment income	45,817,527
Employer contributions	67,055,380
Member contributions	-
Other	-
Total Receivables	\$ 213,511,851
Investments	
Equity securities	\$ 9,261,462,836
Fixed income securities	2,807,089,435
Real estate investments	1,188,494,377
Alternative investments	888,218,644
Total Investments	\$ 14,145,265,292
Invested Securities Lending Collateral	\$ 1,232,818,935
Equipment at cost, net of depreciation	\$ 8,297,696
Total Assets	\$ 16,256,353,097
 Liabilities	
Payables	
Accounts and other payables	\$ 50,822,998
Payables for securiites purchased	219,884,122
Securities lending collateral	1,232,818,935
Notes payable	247,362,486
Total Liabilities	\$ 1,750,888,541
 Net Position Restricted for Pensions	 \$ 14,505,464,556

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION
for Year Ended June 30, 2015

	<u>Year Ending June 30, 2015</u>
Additions	
Contributions	
Non-Employer Contributing Entity	\$ -
Employer	717,792,981
Employer (picked-up employee contributions)	221,909,859
Employee	1,595,560
Other	-
Total Contributions	<u>\$ 941,298,400</u>
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 231,015,994
Interest and Dividends	233,536,870
Less Investment Expense	(89,090,939)
Net Investment Income	<u>\$ 375,461,925</u>
Other	\$ 180,974,550
Total Additions	<u>\$ 1,497,734,875</u>
Deductions	
Benefit payments, including refunds of employee contributions	\$ 1,181,252,658
Pension Plan Administrative Expense	14,032,964
Other	-
Total Deductions	<u>\$ 1,195,285,622</u>
Net Increase in Net Position	\$ 302,449,253
Net Position Restricted for Pensions	
Beginning of Year	<u>\$ 14,203,015,303</u>
End of Year	<u>\$ 14,505,464,556</u>

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY AND RELATED RATIOS
Fiscal Year Ended June 30, 2015

A. Total pension liability	
1. Service Cost	\$ 437,901,029
2. Interest on the Total Pension Liability	1,693,252,684
3. Changes of benefit terms	0
4. Difference between expected and actual experience of the Total Pension Liability	(192,816,757)
5. Changes of assumptions	261,213,541
6. Benefit payments, including refunds of employee contributions	(1,181,252,658)
7. Net change in total pension liability	\$ 1,018,297,839
8. Total pension liability – beginning	22,220,097,547
9. Total pension liability – ending	<u><u>\$ 23,238,395,386</u></u>
B. Plan fiduciary net position	
1. Contributions – employer	\$ 717,792,981
2. Contributions – employer (picked-up employee contributions)	221,909,859
3. Contributions – employee	1,595,560
4. Net investment income	556,436,475
5. Benefit payments, including refunds of employee contributions	(1,181,252,658)
6. Pension Plan Administrative Expense	(14,032,964)
7. Other	-
8. Net change in plan fiduciary net position	\$ 302,449,253
9. Plan fiduciary net position – beginning	14,203,015,303
10. Plan fiduciary net position – ending	<u><u>\$ 14,505,464,556</u></u>
C. Net pension liability	<u><u>\$ 8,732,930,830</u></u>
D. Plan fiduciary net position as a percentage of the total pension liability	62.42%
E. Covered-employee payroll	\$ 3,995,447,345
F. Net pension liability as a percentage of covered employee payroll	218.57%

SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION
Schedule of the Employers' Net Pension Liability
Last 10 Fiscal Years (which may be built prospectively)

FY Ending June 30,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll	Net Pension Liability as a % of Covered Payroll
2006						
2007						
2008						
2009						
2010						
2011						
2012						
2013	\$ 21,243,744,377	\$ 12,311,827,950	\$ 8,931,916,427	57.96%	\$ 3,720,809,962	240.05%
2014	22,220,097,547	14,203,015,303	8,017,082,244	63.92%	3,829,002,983	209.38%
2015	23,238,395,386	14,505,464,556	8,732,930,830	62.42%	3,995,447,345	218.57%

SCHEDULES OF REQUIRED SUPPLEMENTARY INFORMATION
Schedule of Changes in the Employers' Net Pension Liability and Related Ratios

Last 10 Fiscal Years (which may be built prospectively)

Fiscal year ending June 30,	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
Total Pension Liability										
Service Cost	\$ 437,901,029	\$ 421,956,129								
Interest on the Total Pension Liability	1,693,252,684	1,618,917,776								
Benefit Changes	-	-								
Difference between Expected and Actual Experience	(192,816,757)	66,400,876								
Assumption Changes	261,213,541	-								
Benefit Payments	(1,170,744,770)	(1,122,445,642)								
Refunds	(10,507,888)	(8,475,969)								
Net Change in Total Pension Liability	1,018,297,839	976,353,170								
Total Pension Liability - Beginning	22,220,097,547	21,243,744,377								
Total Pension Liability - Ending (a)	\$ 23,238,395,386	\$ 22,220,097,547								
Plan Fiduciary Net Position										
Employer Contributions	\$ 717,792,981	\$ 653,127,697								
Employer Contributions (picked-up employee contributions)	221,909,859	\$ 204,821,010								
Employee Contributions	1,595,560	1,306,327								
Pension Plan Net Investment Income	556,436,475	2,175,479,960								
Benefit Payments	(1,170,744,770)	(1,122,445,642)								
Refunds	(10,507,888)	(8,475,969)								
Pension Plan Administrative Expense	(14,032,964)	(12,626,030)								
Other	-	-								
Net Change in Plan Fiduciary Net Position	302,449,253	1,891,187,353								
Plan Fiduciary Net Position - Beginning	14,203,015,303	12,311,827,950								
Plan Fiduciary Net Position - Ending (b)	\$ 14,505,464,556	\$ 14,203,015,303								
Net Pension Liability - Ending (a) - (b)	8,732,930,830	8,017,082,244								
Plan Fiduciary Net Position as a Percentage										
of Total Pension Liability	62.42 %	63.92 %								
Covered Employee Payroll	\$ 3,995,447,345	\$ 3,829,002,983								
Net Pension Liability as a Percentage										
of Covered Employee Payroll	218.57 %	209.38 %								
Notes to Schedule:										

SECTION D

NOTES TO FINANCIAL STATEMENTS

Single Discount Rate

A single discount rate of 7.65% was used to measure the total pension liability. This single discount rate was based on the expected rate of return on pension plan investments of 7.65%. The projection of cash flows used to determine this single discount rate assumed that plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability to changes in the single discount rate, the following presents the plan's net pension liability, calculated using a single discount rate of 7.65%, as well as what the plan's net pension liability would be if it were calculated using a single discount rate that is 1-percentage-point lower or 1-percentage-point higher:

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

1% Decrease	Current Single Discount Rate Assumption	1% Increase
6.65%	7.65%	8.65%
\$11,056,770,369	\$8,732,930,830	\$6,409,091,292

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	44,283
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	21,253
Active Plan Members	67,310
Total Plan Members	132,846

SECTION E

CALCULATION OF THE SINGLE DISCOUNT RATE

CALCULATION OF THE SINGLE DISCOUNT RATE

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the assumed valuation discount rate is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a tax-exempt municipal bond rate is required, as described in the following paragraph.

The *single discount rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Federal Reserve) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.65%; the municipal bond rate is 3.80%; and the resulting single discount rate is 7.65%.

The tables in this section provide background for the development of the single discount rate.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities).

The **Projection of Plan Fiduciary Net Position** table shows the development of expected asset levels in future years.

The **Present Values of Projected Benefit Payments** table shows the development of the Single Discount Rate (SDR). It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR.

SINGLE DISCOUNT RATE DEVELOPMENT

Projection of Contributions Beginning July 1, 2015

Year	Payroll for Current Employees	Payroll for Future Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Employer Contributions for Future Employees	Total Contributions
1	3,906,772,783	\$ 264,629,125	\$ 4,171,401,908	\$ 203,933,539	\$ 696,968,265	\$ 41,526,866	\$ 942,428,670
2	3,742,597,292	\$ 574,803,683	4,317,400,975	195,363,579	667,679,357	90,200,938	953,243,874
3	3,597,543,608	\$ 870,966,401	4,468,510,009	187,791,776	641,801,780	136,676,206	966,269,762
4	3,462,762,595	\$ 1,162,145,264	4,624,907,859	180,756,207	617,756,847	182,369,383	980,882,437
5	3,336,940,221	\$ 1,449,839,413	4,786,779,634	174,188,280	595,310,135	227,515,722	997,014,137
6	3,215,181,636	\$ 1,739,135,285	4,954,316,921	167,832,481	573,588,404	272,913,411	1,014,334,296
7	3,094,551,755	\$ 2,033,166,259	5,127,718,014	161,535,602	552,068,033	319,054,155	1,032,657,790
8	2,974,778,176	\$ 2,332,409,968	5,307,188,144	155,283,421	530,700,427	366,012,907	1,051,996,755
9	2,854,769,364	\$ 2,638,170,365	5,492,939,729	149,018,961	509,290,855	413,994,288	1,072,304,104
10	2,733,291,336	\$ 2,951,901,283	5,685,192,620	142,677,808	487,619,174	463,226,441	1,093,523,423
11	2,611,526,162	\$ 3,272,648,199	5,884,174,361	136,321,666	465,896,267	513,559,579	1,115,777,512
12	2,488,693,831	\$ 3,601,426,633	6,090,120,464	129,909,818	443,982,979	565,153,060	1,139,045,857
13	2,364,909,284	\$ 3,938,365,396	6,303,274,680	123,448,265	421,899,816	618,027,099	1,163,375,180
14	2,242,672,702	\$ 4,281,216,592	6,523,889,294	117,067,515	400,092,810	671,828,946	1,188,989,271
15	2,121,176,160	\$ 4,631,049,259	6,752,225,419	110,725,396	378,417,827	726,726,358	1,215,869,581
16	1,999,986,940	\$ 4,988,566,369	6,988,553,309	104,399,318	356,797,670	782,829,649	1,244,026,637
17	1,877,963,698	\$ 5,355,188,977	7,233,152,675	98,029,705	335,028,724	840,361,819	1,273,420,248
18	1,754,933,840	\$ 5,731,379,178	7,486,313,019	91,607,546	313,080,197	899,395,381	1,304,083,124
19	1,633,365,865	\$ 6,114,968,110	7,748,333,974	85,261,698	291,392,470	959,589,988	1,336,244,156
20	1,513,733,546	\$ 6,505,792,118	8,019,525,663	79,016,891	270,050,065	1,020,919,957	1,369,986,913
21	1,395,028,419	\$ 6,905,180,643	8,300,209,062	72,820,483	248,873,070	1,083,593,911	1,405,287,464
22	1,278,785,045	\$ 7,311,931,334	8,590,716,379	66,752,579	228,135,252	1,147,423,171	1,442,311,002
23	1,166,305,222	\$ 7,725,086,229	8,891,391,452	60,881,133	208,068,852	1,212,257,410	1,481,207,395
24	1,057,930,533	\$ 8,144,659,620	9,202,590,153	55,223,974	188,734,807	1,278,098,869	1,522,057,650
25	953,734,564	\$ 8,570,946,245	9,524,680,808	49,784,944	170,146,246	1,344,993,801	1,564,924,991
26	854,376,268	\$ 9,003,668,369	9,858,044,636	44,598,441	152,420,726	1,412,898,623	1,609,917,790
27	759,966,287	\$ 9,443,109,912	10,203,076,199	39,670,240	135,577,986	1,481,857,887	1,657,106,113
28	670,789,408	\$ 9,889,394,457	10,560,183,866	35,015,207	119,668,830	1,551,890,989	1,706,575,026
29	586,928,573	\$ 10,342,861,728	10,929,790,301	30,637,672	104,708,057	1,623,051,238	1,758,396,967
30	508,343,214	\$ 10,803,989,747	11,312,332,962	26,535,516	90,688,429	1,695,413,648	1,812,637,593
31	436,779,611	\$ 11,271,485,004	11,708,264,615	22,799,896	77,921,483	1,768,775,235	1,869,496,614
32	372,326,173	\$ 11,745,727,704	12,118,053,877	19,435,426	66,422,989	1,843,195,664	1,929,054,079
33	315,042,021	\$ 12,227,143,741	12,542,185,762	16,445,194	56,203,497	1,918,741,767	1,991,390,458
34	263,707,525	\$ 12,717,454,739	12,981,162,264	13,765,533	47,045,423	1,995,683,709	2,056,494,665
35	218,061,453	\$ 13,217,441,490	13,435,502,943	11,382,808	38,902,163	2,074,144,017	2,124,428,988
36	177,740,163	\$ 13,728,005,384	13,905,745,546	9,278,036	31,708,845	2,154,264,140	2,195,251,021
37	142,837,212	\$ 14,249,609,429	14,392,446,640	7,456,102	25,482,159	2,236,116,737	2,269,054,998
38	113,689,219	\$ 14,782,493,054	14,896,182,273	5,934,577	20,282,157	2,319,739,380	2,345,956,114
39	90,046,698	\$ 15,327,501,954	15,417,548,652	4,700,438	16,064,331	2,405,264,778	2,426,029,547
40	70,667,911	\$ 15,886,494,944	15,957,162,855	3,688,865	12,607,155	2,492,984,627	2,509,280,647
41	54,896,080	\$ 16,460,767,475	16,515,663,555	2,865,575	9,793,461	2,583,102,214	2,595,761,250
42	41,996,519	\$ 17,051,715,260	17,093,711,780	2,192,218	7,492,179	2,675,836,561	2,685,520,958
43	31,955,640	\$ 17,660,036,052	17,691,991,692	1,668,084	5,700,886	2,771,297,164	2,778,666,134
44	24,218,894	\$ 18,286,992,507	18,311,211,401	1,264,226	4,320,651	2,869,682,164	2,875,267,041
45	18,004,099	\$ 18,934,099,701	18,952,103,800	939,814	3,211,931	2,971,229,314	2,975,381,059
46	13,307,136	\$ 19,602,120,298	19,615,427,433	694,632	2,373,993	3,076,058,295	3,079,126,920
47	9,507,078	\$ 20,292,460,315	20,301,967,393	496,269	1,696,063	3,184,389,746	3,186,582,078
48	6,582,539	\$ 21,005,953,713	21,012,536,252	343,609	1,174,325	3,296,354,536	3,297,872,470
49	4,368,701	\$ 21,743,606,320	21,747,975,021	228,046	779,376	3,412,110,505	3,413,117,927
50	2,650,637	\$ 22,506,503,510	22,509,154,147	138,363	472,874	3,531,827,974	3,532,439,211

SINGLE DISCOUNT RATE DEVELOPMENT
Projection of Contributions Beginning July 1, 2015
(Continued)

Year	Payroll for Current Employees	Payroll for Future Employees	Total Employee Payroll	Contributions from Current Employees	Employer Contributions for Current Employees	Employer Contributions for Future Employees	Total Contributions
51	1,336,000	\$ 23,295,638,542	23,296,974,542	69,739	238,342	3,655,662,810	3,655,970,891
52	536,100	\$ 24,111,832,550	24,112,368,651	27,984	95,640	3,783,743,870	3,783,867,494
53	175,460	\$ 24,956,126,094	24,956,301,553	9,159	31,302	3,916,234,444	3,916,274,905
54	72,807	\$ 25,829,699,301	25,829,772,108	3,801	12,989	4,053,319,722	4,053,336,512
55	31,219	\$ 26,733,782,913	26,733,814,132	1,630	5,569	4,195,192,838	4,195,200,037
56	14,007	\$ 27,669,483,619	27,669,497,626	731	2,499	4,342,027,460	4,342,030,690
57	1,758	\$ 28,637,928,286	28,637,930,043	92	314	4,494,000,420	4,494,000,826
58	-	\$ 29,640,257,595	29,640,257,595	-	-	4,651,290,720	4,651,290,720
59	-	\$ 30,677,666,610	30,677,666,610	-	-	4,814,085,895	4,814,085,895
60	-	\$ 31,751,384,942	31,751,384,942	-	-	4,982,578,902	4,982,578,902
61	-	\$ 32,862,683,415	32,862,683,415	-	-	5,156,969,163	5,156,969,163
62	-	\$ 34,012,877,334	34,012,877,334	-	-	5,337,463,084	5,337,463,084
63	-	\$ 35,203,328,041	35,203,328,041	-	-	5,524,274,292	5,524,274,292
64	-	\$ 36,435,444,522	36,435,444,522	-	-	5,717,623,892	5,717,623,892
65	-	\$ 37,710,685,081	37,710,685,081	-	-	5,917,740,729	5,917,740,729
66	-	\$ 39,030,559,059	39,030,559,059	-	-	6,124,861,654	6,124,861,654
67	-	\$ 40,396,628,626	40,396,628,626	-	-	6,339,231,812	6,339,231,812
68	-	\$ 41,810,510,628	41,810,510,628	-	-	6,561,104,925	6,561,104,925
69	-	\$ 43,273,878,500	43,273,878,500	-	-	6,790,743,598	6,790,743,598
70	-	\$ 44,788,464,247	44,788,464,247	-	-	7,028,419,624	7,028,419,624
71	-	\$ 46,356,060,496	46,356,060,496	-	-	7,274,414,310	7,274,414,310
72	-	\$ 47,978,522,613	47,978,522,613	-	-	7,529,018,811	7,529,018,811
73	-	\$ 49,657,770,904	49,657,770,904	-	-	7,792,534,470	7,792,534,470
74	-	\$ 51,395,792,886	51,395,792,886	-	-	8,065,273,176	8,065,273,176
75	-	\$ 53,194,645,637	53,194,645,637	-	-	8,347,557,737	8,347,557,737
76	-	\$ 55,056,458,234	55,056,458,234	-	-	8,639,722,258	8,639,722,258
77	-	\$ 56,983,434,273	56,983,434,273	-	-	8,942,112,537	8,942,112,537
78	-	\$ 58,977,854,472	58,977,854,472	-	-	9,255,086,476	9,255,086,476
79	-	\$ 61,042,079,379	61,042,079,379	-	-	9,579,014,503	9,579,014,503
80	-	\$ 63,178,552,157	63,178,552,157	-	-	9,914,280,010	9,914,280,010
81	-	\$ 65,389,801,482	65,389,801,482	-	-	10,261,279,811	10,261,279,811
82	-	\$ 67,678,444,534	67,678,444,534	-	-	10,620,424,604	10,620,424,604
83	-	\$ 70,047,190,093	70,047,190,093	-	-	10,992,139,465	10,992,139,465
84	-	\$ 72,498,841,746	72,498,841,746	-	-	11,376,864,346	11,376,864,346
85	-	\$ 75,036,301,207	75,036,301,207	-	-	11,775,054,598	11,775,054,598
86	-	\$ 77,662,571,750	77,662,571,750	-	-	12,187,181,509	12,187,181,509
87	-	\$ 80,380,761,761	80,380,761,761	-	-	12,613,732,862	12,613,732,862
88	-	\$ 83,194,088,422	83,194,088,422	-	-	13,055,213,512	13,055,213,512
89	-	\$ 86,105,881,517	86,105,881,517	-	-	13,512,145,985	13,512,145,985
90	-	\$ 89,119,587,370	89,119,587,370	-	-	13,985,071,095	13,985,071,095
91	-	\$ 92,238,772,928	92,238,772,928	-	-	14,474,548,583	14,474,548,583
92	-	\$ 95,467,129,981	95,467,129,981	-	-	14,981,157,784	14,981,157,784
93	-	\$ 98,808,479,530	98,808,479,530	-	-	15,505,498,306	15,505,498,306
94	-	\$ 102,266,776,314	102,266,776,314	-	-	16,048,190,747	16,048,190,747
95	-	\$ 105,846,113,485	105,846,113,485	-	-	16,609,877,423	16,609,877,423
96	-	\$ 109,550,727,457	109,550,727,457	-	-	17,191,223,133	17,191,223,133
97	-	\$ 113,385,002,918	113,385,002,918	-	-	17,792,915,942	17,792,915,942
98	-	\$ 117,353,478,020	117,353,478,020	-	-	18,415,668,000	18,415,668,000
99	-	\$ 121,460,849,750	121,460,849,750	-	-	19,060,216,380	19,060,216,380
100	-	\$ 125,711,979,492	125,711,979,492	-	-	19,727,323,954	19,727,323,954

SINGLE DISCOUNT RATE DEVELOPMENT

Projection of Plan Fiduciary Net Position Beginning July 1, 2015

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.65%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)
1	\$ 14,505,464,556	\$ 942,428,670	\$ 1,307,276,381	\$ 14,524,118	\$ 1,095,424,455	\$ 15,221,517,183
2	15,221,517,183	953,243,874	1,343,597,271	13,658,152	1,149,277,378	15,966,783,012
3	15,966,783,012	966,269,762	1,425,383,840	12,983,486	1,203,733,913	16,698,419,361
4	16,698,419,361	980,882,437	1,507,582,757	12,385,812	1,257,188,995	17,416,522,225
5	17,416,522,225	997,014,137	1,588,342,507	11,847,645	1,309,717,598	18,123,063,808
6	18,123,063,808	1,014,334,296	1,670,511,480	11,348,125	1,361,352,024	18,816,890,523
7	18,816,890,523	1,032,657,790	1,754,445,514	10,874,678	1,411,984,183	19,496,212,304
8	19,496,212,304	1,051,996,755	1,837,647,758	10,407,666	1,461,572,075	20,161,725,710
9	20,161,725,710	1,072,304,104	1,920,569,612	9,950,277	1,510,150,151	20,813,660,076
10	20,813,660,076	1,093,523,423	2,003,934,438	9,496,983	1,557,706,885	21,451,458,962
11	21,451,458,962	1,115,777,512	2,086,824,447	9,045,192	1,604,238,876	22,075,605,710
12	22,075,605,710	1,139,045,857	2,168,741,000	8,600,346	1,649,800,846	22,687,111,067
13	22,687,111,067	1,163,375,180	2,249,549,518	8,155,830	1,694,477,174	23,287,258,072
14	23,287,258,072	1,188,989,271	2,327,118,550	7,716,111	1,738,454,271	23,879,866,953
15	23,879,866,953	1,215,869,581	2,401,723,140	7,287,190	1,782,013,138	24,468,739,342
16	24,468,739,342	1,244,026,637	2,473,697,478	6,864,356	1,825,432,623	25,057,636,769
17	25,057,636,769	1,273,420,248	2,543,169,033	6,444,066	1,868,994,323	25,650,438,241
18	25,650,438,241	1,304,083,124	2,609,558,993	6,023,594	1,913,018,042	26,251,956,820
19	26,251,956,820	1,336,244,156	2,671,554,193	5,606,535	1,957,929,743	26,868,969,991
20	26,868,969,991	1,369,986,913	2,728,466,880	5,199,329	2,004,276,620	27,509,567,315
21	27,509,567,315	1,405,287,464	2,781,216,289	4,800,925	2,052,642,153	28,181,479,718
22	28,181,479,718	1,442,311,002	2,827,956,193	4,407,775	2,103,693,410	28,895,120,163
23	28,895,120,163	1,481,207,395	2,868,084,715	4,027,961	2,158,254,904	29,662,469,786
24	29,662,469,786	1,522,057,650	2,901,826,627	3,661,738	2,217,237,784	30,496,276,854
25	30,496,276,854	1,564,924,991	2,929,130,168	3,310,798	2,281,621,546	31,410,382,426
26	31,410,382,426	1,609,917,790	2,948,656,513	2,975,265	2,352,519,363	32,421,187,800
27	32,421,187,800	1,657,106,113	2,960,702,812	2,658,450	2,431,177,282	33,546,109,934
28	33,546,109,934	1,706,575,026	2,964,731,455	2,358,261	2,518,951,159	34,804,546,403
29	34,804,546,403	1,758,396,967	2,961,343,175	2,074,553	2,617,305,079	36,216,830,720
30	36,216,830,720	1,812,637,593	2,950,461,542	1,808,821	2,727,799,833	37,804,997,783
31	37,804,997,783	1,869,496,614	2,931,280,325	1,562,089	2,852,158,821	39,593,810,804
32	39,593,810,804	1,929,054,079	2,903,299,939	1,341,635	2,992,297,919	41,610,521,228
33	41,610,521,228	1,991,390,458	2,866,244,675	1,143,578	3,150,315,379	43,884,838,812
34	43,884,838,812	2,056,494,665	2,821,412,216	966,355	3,328,434,920	46,447,389,826
35	46,447,389,826	2,124,428,988	2,769,106,464	807,049	3,528,990,489	49,330,895,790
36	49,330,895,790	2,195,251,021	2,710,245,481	665,893	3,754,452,967	52,569,688,405
37	52,569,688,405	2,269,054,998	2,644,899,777	540,870	4,007,449,696	56,200,752,452
38	56,200,752,452	2,345,956,114	2,572,998,774	433,469	4,290,816,930	60,264,093,254
39	60,264,093,254	2,426,029,547	2,494,996,204	343,606	4,607,600,868	64,802,383,858
40	64,802,383,858	2,509,280,647	2,412,055,959	270,918	4,961,022,512	69,860,360,140
41	69,860,360,140	2,595,761,250	2,324,745,490	212,140	5,354,484,921	75,485,648,683
42	75,485,648,683	2,685,520,958	2,233,771,354	163,909	5,791,606,990	81,728,841,367
43	81,728,841,367	2,778,666,134	2,139,510,944	124,718	6,276,248,879	88,644,120,719
44	88,644,120,719	2,875,267,041	2,042,593,579	94,788	6,812,534,551	96,289,233,945
45	96,289,233,945	2,975,381,059	1,943,895,393	71,559	7,404,851,025	104,725,499,076
46	104,725,499,076	3,079,126,920	1,843,679,345	53,164	8,057,883,785	114,018,777,272
47	114,018,777,272	3,186,582,078	1,742,761,612	38,976	8,776,643,497	124,239,202,260
48	124,239,202,260	3,297,872,470	1,641,548,573	27,662	9,566,484,913	135,461,983,407
49	135,461,983,407	3,413,117,927	1,540,490,178	18,919	10,433,149,166	147,767,741,403
50	147,767,741,403	3,532,439,211	1,440,142,224	12,396	11,382,787,418	161,242,813,412

SINGLE DISCOUNT RATE DEVELOPMENT
Projection of Plan Fiduciary Net Position Beginning July 1, 2015
(Continued)

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Administrative Expenses	Projected Investment Earnings at 7.65%	Projected Ending Plan Net Position
(a)	(b)	(c)	(d)	(e)	(f)=(a)+(b)-(c)-(d)+(e)	
51	161,242,813,412	3,655,970,891	\$ 1,340,921,083	7,454	12,421,993,907	175,979,849,674
52	175,979,849,674	3,783,867,494	\$ 1,243,078,334	3,700	13,557,852,747	192,078,487,881
53	192,078,487,881	3,916,274,905	\$ 1,147,001,082	1,495	14,797,977,150	209,645,737,360
54	209,645,737,360	4,053,336,512	\$ 1,053,169,058	451	16,150,540,717	228,796,445,080
55	228,796,445,080	4,195,200,037	\$ 962,089,651	166	17,624,315,753	249,653,871,052
56	249,653,871,052	4,342,030,690	\$ 874,144,221	75	19,228,723,553	272,350,481,000
57	272,350,481,000	4,494,000,826	\$ 789,688,969	27	20,973,890,850	297,028,683,680
58	297,028,683,680	4,651,290,720	\$ 709,038,352	-	22,870,706,875	323,841,642,923
59	323,841,642,923	4,814,085,895	\$ 632,496,615	-	24,930,884,205	352,954,116,408
60	352,954,116,408	4,982,578,902	\$ 560,346,553	-	27,167,023,414	384,543,372,171
61	384,543,372,171	5,156,969,163	\$ 492,837,557	-	29,592,683,631	418,800,187,407
62	418,800,187,407	5,337,463,084	\$ 430,177,596	-	32,222,459,252	455,929,932,148
63	455,929,932,148	5,524,274,292	\$ 372,516,017	-	35,072,063,500	496,153,753,922
64	496,153,753,922	5,717,623,892	\$ 319,925,178	-	38,158,419,743	539,709,872,380
65	539,709,872,380	5,917,740,729	\$ 272,400,952	-	41,499,760,534	586,854,972,691
66	586,854,972,691	6,124,861,654	\$ 229,877,557	-	45,115,733,648	637,865,690,437
67	637,865,690,437	6,339,231,812	\$ 192,220,223	-	49,027,515,973	693,040,217,999
68	693,040,217,999	6,561,104,925	\$ 159,228,000	-	53,257,936,297	752,700,031,220
69	752,700,031,220	6,790,743,598	\$ 130,643,849	-	57,831,607,030	817,191,737,999
70	817,191,737,999	7,028,419,624	\$ 106,149,870	-	62,775,065,819	886,889,073,573
71	886,889,073,573	7,274,414,310	\$ 85,405,900	-	68,116,926,741	962,195,008,724
72	962,195,008,724	7,529,018,811	\$ 68,029,987	-	73,888,042,334	1,043,544,039,882
73	1,043,544,039,882	7,792,534,470	\$ 53,638,789	-	80,121,677,280	1,131,404,612,844
74	1,131,404,612,844	8,065,273,176	\$ 41,857,640	-	86,853,693,461	1,226,281,721,841
75	1,226,281,721,841	8,347,557,737	\$ 32,328,322	-	94,122,748,504	1,328,719,699,760
76	1,328,719,699,760	8,639,722,258	\$ 24,712,692	-	101,970,509,114	1,439,305,218,440
77	1,439,305,218,440	8,942,112,537	\$ 18,699,577	-	110,441,880,354	1,558,670,511,754
78	1,558,670,511,754	9,255,086,476	\$ 14,008,980	-	119,585,252,065	1,687,496,841,315
79	1,687,496,841,315	9,579,014,503	\$ 10,393,059	-	129,452,763,973	1,826,518,226,732
80	1,826,518,226,732	9,914,280,010	\$ 7,639,672	-	140,100,590,937	1,976,525,458,007
81	1,976,525,458,007	10,261,279,811	\$ 5,569,197	-	151,589,250,036	2,138,370,418,656
82	2,138,370,418,656	10,620,424,604	\$ 4,030,674	-	163,983,931,446	2,312,970,744,032
83	2,312,970,744,032	10,992,139,465	\$ 2,900,423	-	177,354,854,874	2,501,314,837,948
84	2,501,314,837,948	11,376,864,346	\$ 2,079,688	-	191,777,653,437	2,704,467,276,043
85	2,704,467,276,043	11,775,054,598	\$ 1,488,446	-	207,333,787,275	2,923,574,629,470
86	2,923,574,629,470	12,187,181,509	\$ 1,064,678	-	224,110,989,101	3,159,871,735,402
87	3,159,871,735,402	12,613,732,862	\$ 762,075	-	242,203,744,013	3,414,688,450,203
88	3,414,688,450,203	13,055,213,512	\$ 546,708	-	261,713,806,252	3,689,456,923,259
89	3,689,456,923,259	13,512,145,985	\$ 392,877	-	282,750,755,828	3,985,719,432,195
90	3,985,719,432,195	13,985,071,095	\$ 282,614	-	305,432,597,960	4,305,136,818,636
91	4,305,136,818,636	14,474,548,583	\$ 203,801	-	329,886,408,502	4,649,497,571,920
92	4,649,497,571,920	14,981,157,784	\$ 146,880	-	356,249,028,999	5,020,727,611,823
93	5,020,727,611,823	15,505,498,306	\$ 105,839	-	384,667,815,052	5,420,900,819,342
94	5,420,900,819,342	16,048,190,747	\$ 75,947	-	415,301,442,034	5,852,250,376,176
95	5,852,250,376,176	16,609,877,423	\$ 54,070	-	448,320,772,581	6,317,180,972,110
96	6,317,180,972,110	17,191,223,133	\$ 38,168	-	483,909,790,496	6,818,281,947,571
97	6,818,281,947,571	17,792,915,942	\$ 26,853	-	522,266,606,208	7,358,341,442,868
98	7,358,341,442,868	18,415,668,000	\$ 18,885	-	563,604,539,235	7,940,361,631,218
99	7,940,361,631,218	19,060,216,380	\$ 13,318	-	608,153,283,538	8,567,575,117,819
100	8,567,575,117,819	19,727,323,954	\$ 9,346	-	656,160,162,086	9,243,462,594,512

SINGLE DISCOUNT RATE DEVELOPMENT

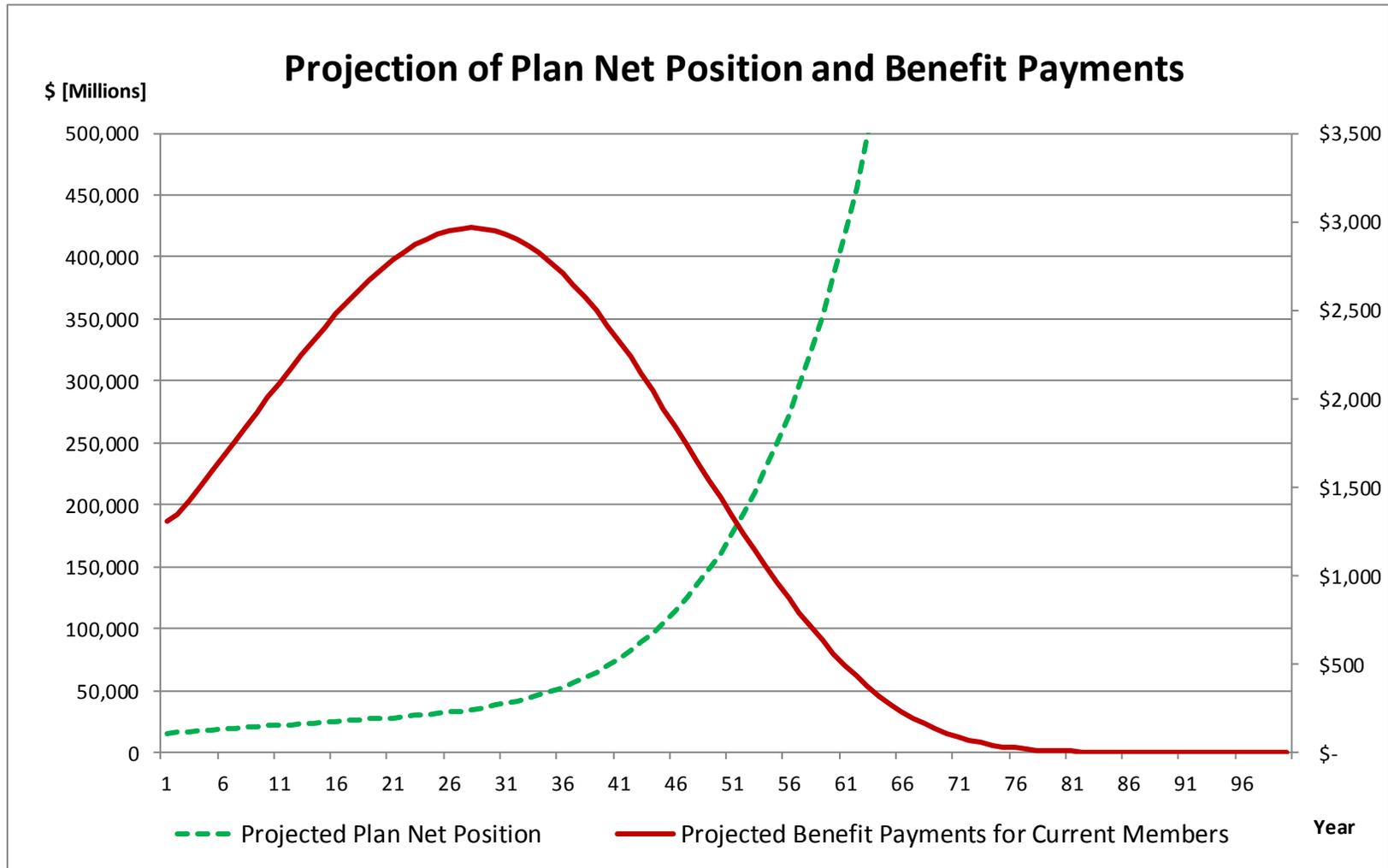
Present Values of Projected Benefit Payments Beginning July 1, 2015

Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v ^{(a)-.5}	(g)=(e)*vf ^{(a)-.5}	(h)=(c)/(1+sdr) ^{(a)-.5}
1	\$ 14,505,464,556	\$ 1,307,276,381	\$ 1,307,276,381	\$ -	\$ 1,259,970,560	\$ -	\$ 1,259,970,560
2	15,221,517,183	1,343,597,271	1,343,597,271	-	1,202,951,345	-	1,202,951,345
3	15,966,783,012	1,425,383,840	1,425,383,840	-	1,185,486,862	-	1,185,486,862
4	16,698,419,361	1,507,582,757	1,507,582,757	-	1,164,748,184	-	1,164,748,184
5	17,416,522,225	1,588,342,507	1,588,342,507	-	1,139,937,406	-	1,139,937,406
6	18,123,063,808	1,670,511,480	1,670,511,480	-	1,113,710,404	-	1,113,710,404
7	18,816,890,523	1,754,445,514	1,754,445,514	-	1,086,547,366	-	1,086,547,366
8	19,496,212,304	1,837,647,758	1,837,647,758	-	1,057,199,655	-	1,057,199,655
9	20,161,725,710	1,920,569,612	1,920,569,612	-	1,026,386,102	-	1,026,386,102
10	20,813,660,076	2,003,934,438	2,003,934,438	-	994,833,003	-	994,833,003
11	21,451,458,962	2,086,824,447	2,086,824,447	-	962,362,202	-	962,362,202
12	22,075,605,710	2,168,741,000	2,168,741,000	-	929,065,423	-	929,065,423
13	22,687,111,067	2,249,549,518	2,249,549,518	-	895,200,118	-	895,200,118
14	23,287,258,072	2,327,118,550	2,327,118,550	-	860,258,647	-	860,258,647
15	23,879,866,953	2,401,723,140	2,401,723,140	-	824,744,536	-	824,744,536
16	24,468,739,342	2,473,697,478	2,473,697,478	-	789,094,574	-	789,094,574
17	25,057,636,769	2,543,169,033	2,543,169,033	-	753,604,812	-	753,604,812
18	25,650,438,241	2,609,558,993	2,609,558,993	-	718,325,893	-	718,325,893
19	26,251,956,820	2,671,554,193	2,671,554,193	-	683,131,570	-	683,131,570
20	26,868,969,991	2,728,466,880	2,728,466,880	-	648,104,475	-	648,104,475
21	27,509,567,315	2,781,216,289	2,781,216,289	-	613,687,199	-	613,687,199
22	28,181,479,718	2,827,956,193	2,827,956,193	-	579,656,811	-	579,656,811
23	28,895,120,163	2,868,084,715	2,868,084,715	-	546,105,067	-	546,105,067
24	29,662,469,786	2,901,826,627	2,901,826,627	-	513,265,010	-	513,265,010
25	30,496,276,854	2,929,130,168	2,929,130,168	-	481,276,698	-	481,276,698
26	31,410,382,426	2,948,656,513	2,948,656,513	-	450,055,749	-	450,055,749
27	32,421,187,800	2,960,702,812	2,960,702,812	-	419,781,129	-	419,781,129
28	33,546,109,934	2,964,731,455	2,964,731,455	-	390,480,564	-	390,480,564
29	34,804,546,403	2,961,343,175	2,961,343,175	-	362,317,044	-	362,317,044
30	36,216,830,720	2,950,461,542	2,950,461,542	-	335,332,735	-	335,332,735
31	37,804,997,783	2,931,280,325	2,931,280,325	-	309,477,665	-	309,477,665
32	39,593,810,804	2,903,299,939	2,903,299,939	-	284,740,884	-	284,740,884
33	41,610,521,228	2,866,244,675	2,866,244,675	-	261,130,230	-	261,130,230
34	43,884,838,812	2,821,412,216	2,821,412,216	-	238,779,148	-	238,779,148
35	46,447,389,826	2,769,106,464	2,769,106,464	-	217,698,519	-	217,698,519
36	49,330,895,790	2,710,245,481	2,710,245,481	-	197,929,449	-	197,929,449
37	52,569,688,405	2,644,899,777	2,644,899,777	-	179,430,792	-	179,430,792
38	56,200,752,452	2,572,998,774	2,572,998,774	-	162,148,635	-	162,148,635
39	60,264,093,254	2,494,996,204	2,494,996,204	-	146,059,421	-	146,059,421
40	64,802,383,858	2,412,055,959	2,412,055,959	-	131,169,550	-	131,169,550
41	69,860,360,140	2,324,745,490	2,324,745,490	-	117,437,563	-	117,437,563
42	75,485,648,683	2,233,771,354	2,233,771,354	-	104,822,931	-	104,822,931
43	81,728,841,367	2,139,510,944	2,139,510,944	-	93,264,864	-	93,264,864
44	88,644,120,719	2,042,593,579	2,042,593,579	-	82,712,563	-	82,712,563
45	96,289,233,945	1,943,895,393	1,943,895,393	-	73,122,052	-	73,122,052
46	104,725,499,076	1,843,679,345	1,843,679,345	-	64,423,874	-	64,423,874
47	114,018,777,272	1,742,761,612	1,742,761,612	-	56,569,898	-	56,569,898
48	124,239,202,260	1,641,548,573	1,641,548,573	-	49,497,939	-	49,497,939
49	135,461,983,407	1,540,490,178	1,540,490,178	-	43,149,749	-	43,149,749
50	147,767,741,403	1,440,142,224	1,440,142,224	-	37,472,330	-	37,472,330

SINGLE DISCOUNT RATE DEVELOPMENT

PVs of Projected Benefit Payments Beginning July 1, 2015 (continued)

Year	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v ^a ((a)-.5)	(g)=(e)*vf ^a ((a)-.5)	(h)=(c)/((1+sdr) ^a (a-.5))
51	\$ 161,242,813,412	\$ 1,340,921,083	\$ 1,340,921,083	\$ -	\$ 32,411,154	\$ -	\$ 32,411,154
52	175,979,849,674	1,243,078,334	1,243,078,334	-	27,911,022	-	27,911,022
53	192,078,487,881	1,147,001,082	1,147,001,082	-	23,923,628	-	23,923,628
54	209,645,737,360	1,053,169,058	1,053,169,058	-	20,405,501	-	20,405,501
55	228,796,445,080	962,089,651	962,089,651	-	17,316,124	-	17,316,124
56	249,653,871,052	874,144,221	874,144,221	-	14,615,181	-	14,615,181
57	272,350,481,000	789,688,969	789,688,969	-	12,264,875	-	12,264,875
58	297,028,683,680	709,038,352	709,038,352	-	10,229,697	-	10,229,697
59	323,841,642,923	632,496,615	632,496,615	-	8,476,903	-	8,476,903
60	352,954,116,408	560,346,553	560,346,553	-	6,976,244	-	6,976,244
61	384,543,372,171	492,837,557	492,837,557	-	5,699,736	-	5,699,736
62	418,800,187,407	430,177,596	430,177,596	-	4,621,518	-	4,621,518
63	455,929,932,148	372,516,017	372,516,017	-	3,717,644	-	3,717,644
64	496,153,753,922	319,925,178	319,925,178	-	2,965,905	-	2,965,905
65	539,709,872,380	272,400,952	272,400,952	-	2,345,867	-	2,345,867
66	586,854,972,691	229,877,557	229,877,557	-	1,838,981	-	1,838,981
67	637,865,690,437	192,220,223	192,220,223	-	1,428,453	-	1,428,453
68	693,040,217,999	159,228,000	159,228,000	-	1,099,188	-	1,099,188
69	752,700,031,220	130,643,849	130,643,849	-	837,775	-	837,775
70	817,191,737,999	106,149,870	106,149,870	-	632,330	-	632,330
71	886,889,073,573	85,405,900	85,405,900	-	472,605	-	472,605
72	962,195,008,724	68,029,987	68,029,987	-	349,701	-	349,701
73	1,043,544,039,882	53,638,789	53,638,789	-	256,131	-	256,131
74	1,131,404,612,844	41,857,640	41,857,640	-	185,671	-	185,671
75	1,226,281,721,841	32,328,322	32,328,322	-	133,210	-	133,210
76	1,328,719,699,760	24,712,692	24,712,692	-	94,593	-	94,593
77	1,439,305,218,440	18,699,577	18,699,577	-	66,490	-	66,490
78	1,558,670,511,754	14,008,980	14,008,980	-	46,272	-	46,272
79	1,687,496,841,315	10,393,059	10,393,059	-	31,889	-	31,889
80	1,826,518,226,732	7,639,672	7,639,672	-	21,775	-	21,775
81	1,976,525,458,007	5,569,197	5,569,197	-	14,746	-	14,746
82	2,138,370,418,656	4,030,674	4,030,674	-	9,914	-	9,914
83	2,312,970,744,032	2,900,423	2,900,423	-	6,627	-	6,627
84	2,501,314,837,948	2,079,688	2,079,688	-	4,414	-	4,414
85	2,704,467,276,043	1,488,446	1,488,446	-	2,935	-	2,935
86	2,923,574,629,470	1,064,678	1,064,678	-	1,950	-	1,950
87	3,159,871,735,402	762,075	762,075	-	1,297	-	1,297
88	3,414,688,450,203	546,708	546,708	-	864	-	864
89	3,689,456,923,259	392,877	392,877	-	577	-	577
90	3,985,719,432,195	282,614	282,614	-	385	-	385
91	4,305,136,818,636	203,801	203,801	-	258	-	258
92	4,649,497,571,920	146,880	146,880	-	173	-	173
93	5,020,727,611,823	105,839	105,839	-	116	-	116
94	5,420,900,819,342	75,947	75,947	-	77	-	77
95	5,852,250,376,176	54,070	54,070	-	51	-	51
96	6,317,180,972,110	38,168	38,168	-	33	-	33
97	6,818,281,947,571	26,853	26,853	-	22	-	22
98	7,358,341,442,868	18,885	18,885	-	14	-	14
99	7,940,361,631,218	13,318	13,318	-	9	-	9
100	8,567,575,117,819	9,346	9,346	-	6	-	6
Totals					\$ 27,040,079,729	\$ -	\$ 27,040,079,729



SECTION F

GLOSSARY OF TERMS

GLOSSARY OF TERMS

Actuarial Accrued Liability (AAL)

The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability".

Actuarial Assumptions

These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.

Accrued Service

Service credited under the system which was rendered before the date of the actuarial valuation.

Actuarial Equivalent

A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.

Actuarial Cost Method

A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.

Actuarial Gain (Loss)

The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.

Actuarial Present Value

The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future payments at predetermined rates of interest and probabilities of payment.

Actuarial Valuation

The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions.

Actuarial Valuation Date

The date as of which an actuarial valuation is performed.

Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)

A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

GLOSSARY OF TERMS (CONTINUED)

Amortization Payment

The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.

Amortization Method

The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be "open" (meaning, reset each year) or "closed" (the number of years remaining will decline each year).

Cost-of-Living Adjustments

Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.

Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)

A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be sued to pay the benefits of the employees of any employer that provides pensions through the pension plan.

Covered-Employee Payroll

The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.

Deferred Retirement Option Program (DROP)

A program that permits a plan member to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The plan member continues to provide service to the employer and is paid for the service by the employer after the DROP entry date; however, the pensions that would have been paid to the plan member are credited to an individual member account within the defined benefit pension plan until the end of the DROP period. Other variations for DROP exist and will be more fully detailed in the plan provision section of the valuation report.

Deferred Inflows and Outflows

The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.

Discount Rate

For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:

1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period and;
2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

GLOSSARY OF TERMS (CONTINUED)

Entry Age Actuarial Cost Method (EAN)

The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.

GASB

The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.

Fiduciary Net Position

The fiduciary net position is the value of the assets of the trust.

Long-Term Expected Rate of Return

The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.

Money-Weighted Rate of Return

The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.

Multiple-Employer Defined Benefit Pension Plan

A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.

Municipal Bond Rate

The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.

Net Pension Liability (NPL)

The NPL is the liability of employers and nonemployer contribution entities to plan members for benefits provided through a defined benefit pension plan.

Nonemployer Contribution Entities

Nonemployer contribution entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB Accounting statement plan members are not considered nonemployer contribution entities.

Normal Cost

The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method.

GLOSSARY OF TERMS (CONTINUED)

Other Postemployment Benefits (OPEB)

All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other post-employment benefits do not include termination benefits.

Real Rate of Return

The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.

Service Cost

The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.

Total Pension Expense

The total pension expense is the sum of the following pension expense items that are recognized from the beginning to the end of the employer's fiscal year:

1. Total service cost;
2. Interest on total pension liability;
3. Current-period benefit changes;
4. Member contributions;
5. Projected earnings on plan investments;
6. Administrative expense;
7. Other Changes in Plan Fiduciary Net Position;
8. Recognition of beginning deferred outflows (inflows) due to liabilities; and
9. Recognition of beginning deferred outflows (inflows) due to assets.

Total Pension Liability (TPL)

The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.

Unfunded Actuarial Accrued Liability (UAAL)

The UAAL is the difference between actuarial accrued liability and valuation assets.

Valuation Assets

The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of the GASB Statement No. 67, the valuation asset is equal to the market value of assets.